Wet processes are made equally clear in the same way, and the only fault to be found with this division of the work is that it is too brief. Whilst the work merits ungrudging approval, it may be observed that the author, who has done well in giving special prominence to the influence of foreign matter on the metals and alloys, has perhaps exaggerated the relative value of the study of thermal and mechanical treatment of metals as compared with improvements in smelting operations. This has led him to subordinate and curtail descriptions of metallurgical processes, which is to be regretted, because his diagrammatic methods of description are most effective. This part of the work will well bear expansion in the next edition, which will doubtless soon be called for.

THOMAS GIBB.

THE RELATIVITY OF KNOWLEDGE.

The Prevailing Types of Philosophy: Can they Logically reach Reality? By James McCosh, LL.D., Litt.D., &c. (London: Macmillan and Co., 1891.)

WHAT is reality? The plain man when he opens his eyes and stretches forth his hands never questions the practical reality of the objects which surround him. The walnuts which he sees on his plate are resistant to the fingers, the wine in his glass has a *bouquet* the reality of which he can readily put to the satisfactory test of the palate. But the psychologist seeks to analyze these intuitions and perceptions, the validity of which no sane man doubts. He follows the intuitions and perceptions home, and finds that they are in some way associated with certain material transactions within the ivory casket of the human skull. And then he begins to speculate about an ultimate reality behind the reality of perceptions. The blush on the peach—is it really inherent in the fruit, or is it merely a mode of vibration of my own brain-molecules? And these brain-molecules—is their so-called matter aught but a figment of the mind? Or is this mind merely a subtle secretion of the grey matter of the cortex? Thus, many questions can be asked, and many answers given.

Dr. McCosh, in the little volume under notice, inquires, What do the leading philosophic systems of the day make of reality? "I am to put this question," he says, "to each of them. Do they acknowledge it, or do they deny it? Do they accept it in whole, or only in part? Do they attempt to prove it, or simply assume it?"

What, we naturally ask, is the "reality" concerning which Dr. McCosh asks these questions? He replies:—

> "The only way of showing its nature is to point to examples of it. We look on the wall of the room in which we sit, and know it to be real. We see a bird flying, and know it to be an actuality. We are conscious of ourselves in pain, and we are sure of our own existence in a state of pain."

In other words, by "reality" Dr. McCosh means that practical reality which no man in his senses denies or thinks of denying.

The question Dr. McCosh sets himself to consider is therefore this:—How far do the leading philosophic systems of the day agree to regard *as absolute and ultimate* that practical reality, *relative to man as an organism*, in which every man out of Bedlam implicitly believes? Such being the true nature of his question, it is scarcely a matter of surprise that Dr. McCosh should find that neither the experiential and sensational schools nor the *a priori* or Kantian school, nor the Scottish school will agree to do anything of the sort. They all see too clearly the difference between relative and absolute reality to identify them after the fashion of the ex-President of Princeton College. Or, if individual members of any of these schools do so identify them, they are for the most part honest enough avowedly to confess that they do so on theological and not on philosophical grounds.

Into the theological aspects of the question we cannot enter here. Suffice it to say that we have never expressed aught but respect for those who believe that the world was created by Divine fiat, and that man was endowed with faculties which enable him directly to apprehend its existence and nature. But we do not think that philosophy apart from revelation would have been led to this conclusion; and we doubt the wisdom of those who appeal to philosophy in its support.

We would have it clearly understood that it is not to the appeal which Dr. McCosh makes, but the tribunal to which he makes it, that we take exception. "Agnosticism," he says, "is upheld and propagated in the present day by several influential men, such as Mr. Herbert Spencer and Prof. Huxley. It is in the air, and our young men have to breathe it and suffer the consequences. It is evidently exercising a relaxing influence on the faith and doctrinal convictions of the rising generation. It is in my view the grand office, at present, of the higher philosophy, to meet and expose this doubting spirit." We would counsel Dr. McCosh to substitute in future editions for "higher philosophy" other words, and to boldly assume at the outset the theological position on the grounds of fundamental and unalterable conviction. Any conclusions of philosophy, whether experiential, Kantian, or Scottish, which run counter to this fundamental assumption will then, for him and his followers, stand *ipso facto* condemned. If the relativity of human knowledge be one of these unorthodox conclusions, Dr. McCosh is assuredly right for his own part in rejecting it on the grounds of unalterable conviction, though mere unaided and uninspired philosophy has, as his little book plainly shows, conspired with one voice to sanction it.

Dr. McCosh writes clearly, tersely, and forcibly, and gives in a short space an excellent account of the conclusions reached by the prevailing types of philosophy so far as they concern the question of reality.

C. Ll. M.

OUR BOOK SHELF.

An Explanation of the Phonopore, and more especially of the Simplex Phonopore Telegraph. By C. Langdon-Davies. (London: Kegan Paul, Trench, Trübner, and Co., Limited, 1891.)

THE present work contains a plain explanation of the phonopore, and is written in a manner that will be intelligible to all who are acquainted with the elements of electric technics and practical telegraphy. The phenomena which led to the invention of this instrument were the sounds generally known to telephonists

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as induction noises: many attempts seem to have been made to overcome them, and success has been achieved only at a great cost. The author, in investigating the causes of these disturbances, was led to make use of the force from which they were derived, and in the phonopore we have an instrument which is based on the results of the investigation.

This system of telegraphy is used in conjunction with the ordinary system, with the addition of certain instruments and apparatus. Short and rapid electrical impulses (which have no effect on the telegraphic instruments as usually employed) being sent successively along the ordinary wire by means of other apparatus forming part of the system, this pulsatory current is enabled to work relays and other telegraphic instruments; no interruption is caused in the ordinary telegraphic signals, which may be worked as usual and transmitted through the same conductor at the same time.

Of the instruments in the above-mentioned circuit, the principal one is that called by the author the phonopore; its action consists in allowing the vibratory impulses to pass freely through it, while ordinary currents, such as those used in telegraphic working, are stopped by it.

Previous to the description of the simplex phonopore telegraph, the author relates some of the experiments that led him to devise these ingenious instruments. The technicalities pertaining to the principles of their construction and to the methods of arranging them in circuit are then entered upon, and finally a comparison is drawn between the ordinary telegraph and the phonopore telegraph.

The five reports written by well-known men and inserted at the end speak of this new system as highly valuable. The following brief extract shows in a few words Prof. Silvanus P. Thompson's view of the utility of the system:—"In my opinion the experiments and demonstrations have been successful in establishing the entire practicability of satisfactorily working the simplex phonopore telegraph simultaneously with the ordinary telegraphs (both needles and Bright's bells) upon the same ordinary telegraph line."

In concluding our remarks, we must add that the subject-matter is presented in English and French, printed side by side; numerous illustrations are given showing the actual instruments, while others, in diagrammatic form, explain the methods of arranging them in circuit. Altogether the work is one that will be read with interest by electricians and by all those connected with practical telegraphy.

The Naturalist of Cumbrae: being the Life of David Robertson. By the Rev. T. R. R. Stebbing. (London: Kegan Paul, Trench, Trübner, and Co., 1891.)

Mr. Robertson, who is now in his eighty-fifth year, has done much good work as a marine zoologist; and the present record of his career will interest not only his personal friends, but all readers who admire energy, enthusiasm, and intellectual resource. It is no easy task to write a biography of one who is still alive, but Mr. Stebbing has done his work skilfully and with good taste, erring only occasionally by reference to small details which are scarcely worthy of a place in a serious narrative. For many years, as a boy and young man, Mr. Robertson worked as a farm labourer; but, having much intelligence, he missed no opportunity of cultivating his mind, and he contrived to fit himself for the study of medicine in Glasgow. Although he passed through the regular medical course, he preferred business to the life of a doctor; and he was successful enough to be able, in 1860, to retire with a competency. He had long been interested in various branches of natural science, and now he had leisure to gratify his tastes to the utmost. He settled on the Island of Cumbrae, and there he has since worked at marine zoology so steadily, and with so ready a power of interpreting observed phenomena, that he has added considerably to our knowledge, and has had many opportunities of being of service to eminent naturalists, with whose requests for specimens or information he has always been delighted to comply. It is pleasant to read of the friendships thus formed, and of the fine qualities which are so cordially appreciated by all to whom Mr. Robertson is personally known. The book belongs in some ways to the class which Mr. Smiles has made popular, but Mr. Stebbing's hero is distinguished by geniality and modesty of character from the type which most people are apt to associate with the idea of "self-made men."

By Track and Trail: a Journey through Canada. By Edward Roper. (London: W. H. Allen and Co., 1891.)

This book is rather too long, but it contains many interesting passages, and will give much pleasure to any readers who may have special reasons for desiring to obtain information as to the prospects of settlers in the Dominion. Everything set down with regard to agricultural matters is a repetition of what the author heard from men whom he either knew or believed to be trustworthy. His general conclusion is that there is no country under the British flag where a prudent settler has better chances than in Canada. In the course of his narrative he gives some very bright descriptions both of places and people; and he has brought together some valuable notes on the aborigines. Numerous reproductions of original sketches by the author illustrate his story.

An Etymological Dictionary of the German Language. By Friedrich Kluge. Translated from the Fourth German Edition by J. F. Davis. (London: George Bell and Sons, 1891.)

Prof. Kluge's work, of which this is a translation, is well known to all students of the etymology of the German language. The author has not only extensive knowledge, but a sound and penetrating judgment; and he displays a remarkable power of presenting concisely and lucidly results at which he can have arrived only after careful and elaborate research. Mr. Davis's translation is in every way worthy of the original, and no one who may have occasion to use it will fail to appreciate the skill with which he has accomplished a difficult and useful piece of work.

Nature's Wonder-Workers. By Kate Lovell. (London: Cassell and Co., 1890.)

In this book, Miss Lovell tells the life-histories of various insects, her object being "not so much to teach as to give fresh interest to the living, often despised creatures which constantly cross our path." She writes clearly and gracefully, and the information she presents has been derived from the best and latest authorities on entomology. The volume is well illustrated, and will stimulate the interest of its readers in some of the more curious facts of natural science.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* Nature. *No notice is taken of anonymous communications.*]

Phosphograms.

If a glass plate (or a celluloid film) is evenly coated with phosphorescent calcium sulphide in a suitable menstruum, and then exposed for a few minutes in a photographic camera, a phosphorescent negative can be taken of a sunlit view. When this plate is carefully applied to an ordinary photographic film

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